

WHAT IS CLAIMED IS:

1. An information recording medium comprising:
a management area where management information is recorded; and
5 a plurality of physical sector areas used to record a plurality of physical sector data blocks, which are generated by combining some data contained in a plurality of ECC blocks.
2. A medium according to claim 1, wherein the
10 plurality of ECC blocks as a source of the plurality of physical sector data blocks to be recorded in said plurality of physical sector areas is generated via a predetermined process, and
the predetermined process generates the plurality
15 of independent ECC blocks by:
generating sector data formed of a first number of bytes;
generating a sector block by combining a plurality
of sector data items;
20 generating a plurality of segmented blocks by segmenting the sector block; and
individually appending parity data to the plurality of segmented blocks.
3. A medium according to claim 1, wherein the
25 plurality of ECC blocks as a source of the plurality of physical sector data blocks to be recorded in said plurality of physical sector areas is generated via

a predetermined process, and

the predetermined process generates the plurality of independent ECC blocks by:

5 generating sector data which contains a data ID and is formed of a first number of bytes;

generating a sector block by combining a plurality of sector data items;

generating a plurality of segmented blocks by segmenting the sector block;

10 generating outer-code parity data by encoding data in a column direction, which forms each segmented block;

generating inner-code parity data by encoding data in a row direction, which forms each segmented block;

15 and

individually appending the generated outer- and inner-code parity data to each segmented block.

4. A medium according to claim 1, wherein the plurality of ECC blocks as a source of the plurality of physical sector data blocks to be recorded in said
20 plurality of physical sector areas is generated via a predetermined process, and

the predetermined process generates the plurality of independent ECC blocks by:

25 generating sector data which contains a data ID and is formed of a first number of bytes;

generating re-arranged sector data by re-arranging

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data contained in the sector data to predetermined positions;

generating a sector block by combining a plurality of re-arranged sector data items;

5 generating a plurality of segmented blocks by segmenting the sector block;

generating outer-code parity data by encoding data in a column direction, which forms each segmented block;

10 generating inner-code parity data by encoding data in a row direction, which forms each segmented block; and

individually appending the generated outer- and inner-code parity data to each segmented block.

15 5. A medium according to claim 4, wherein each physical sector data block recorded on said physical sector area is formed of a set of data lines each of which is made up of a portion of the sector data and a portion of the inner-code parity data, and consists
20 of a second number of bytes, and data lines each of which is made up of only a portion of the outer-code parity data and consists of the second number of bytes, and a total number of data lines of the set is an integer multiple of the number of ECC blocks.

25 6. A medium according to claim 4, wherein each physical sector data block recorded on said physical sector area contains the data ID, and has a data

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structure in which the data ID is arranged at a specific position.

5 7. A medium according to claim 4, wherein each physical sector data block recorded on said physical sector area contains the data ID, and has a data structure in which the data ID is arranged at a head position, and a data line made up of only a portion of the outer-code parity data is arranged as a final line.

10 8. A medium according to claim 1, wherein said physical sector area is an area on which data extracted in turn from the physical sector data block according to a predetermined rule is recorded in turn.

15 9. A medium according to claim 1, wherein said physical sector area is an area on which data alternately extracted from different data lines in the physical sector data block is recorded in turn.

20 10. A medium according to claim 4, wherein physical sector information which indicates the physical sector data block to be recorded on said physical sector area corresponds to logical sector information which indicates the sector data.

25 11. A medium according to claim 10, wherein an arrangement of at least some data of the plurality of ECC blocks as a source of the plurality of sector data blocks to be recorded on said plurality of physical sector areas corresponds to logical sector information.

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12. An information recording apparatus for recording information on an information recording medium, comprising:

5 generation section configured to generating a plurality of ECC blocks; and
recording section configured to generating a plurality of physical sector data blocks by combining some data contained in the plurality of ECC blocks,
and recording the plurality of physical sector data
10 blocks on a plurality of physical sector areas on the information recording medium.

13. An apparatus according to claim 12, wherein said generation section generate the plurality of independent ECC blocks by:

15 generating sector data which contains a data ID and is formed of a first number of bytes;
generating re-arranged sector data by re-arranging data contained in the sector data to predetermined positions;
20 generating a sector block by combining a plurality of re-arranged sector data items;
generating a plurality of segmented blocks by segmenting the sector block;
generating outer-code parity data by encoding data
25 in a column direction, which forms each segmented block;
generating inner-code parity data by encoding data

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in a row direction, which forms each segmented block;
and

individually appending the generated outer- and
inner-code parity data to each segmented block.

5 14. An apparatus according to claim 13, wherein
said recording section alternately extracts data from
different data lines in the physical sector data block,
and records the extracted data in turn on the physical
sector area.

10 15. An apparatus according to claim 13, wherein
said recording section records the physical sector data
block on the physical sector area with physical sector
information that indicates the physical sector data
block corresponding to logical sector information that
15 indicates the sector data.

 16. An apparatus according to claim 15, wherein
said recording section records the physical sector data
block on the physical sector area with an arrangement
of at least some data of the plurality of ECC blocks
20 corresponding to logical sector information.

 17. An information reproduction apparatus for
reproducing an information recording medium which
comprises a plurality of physical sector areas on which
a plurality of physical sector data blocks generated by
25 combining some data contained in a plurality of ECC
blocks is recorded, comprising:

read-out section configured to reading out the

plurality of physical sector data blocks from the
plurality of physical sector areas on the information
recording medium; and

reproduction section configured to reproducing
5 data by generating the plurality of ECC blocks from the
plurality of readout physical sector data blocks.

18. An apparatus according to claim 17, wherein said reproduction section generates the plurality of ECC blocks via a predetermined process,

10 the predetermined process generates the plurality
of independent ECC blocks by:

generating sector data which contains a data ID
and is formed of a first number of bytes;

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        generating re-arranged sector data by re-arranging
15    data contained in the sector data to predetermined
    positions;

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generating a sector block by combining a plurality
of re-arranged sector data items;

generating a plurality of segmented blocks by
20 segmenting the sector block;

generating outer-code parity data by encoding data
in a column direction, which forms each segmented
block;

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        generating inner-code parity data by encoding data
25    in a row direction, which forms each segmented block;
    and

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individually appending the generated outer- and

inner-code parity data to each segmented block, and
said reproduction means reproduces the sector data
by utilizing the predetermined process.

19. An apparatus according to claim 18, wherein
5 the physical sector data block read out by said read-
out section is formed of a set of data lines each of
which is made up of a portion of the sector data and a
portion of the inner-code parity data, and consists of
a second number of bytes, and data lines each of which
10 is made up of only a portion of the outer-code parity
data and consists of the second number of bytes, and
a total number of data lines of the set is an integer
multiple of the number of ECC blocks,

each physical sector data block recorded on said
15 physical sector area contains the data ID, and has
a data structure in which the data ID is arranged at
a head position, and a data line made up of only
a portion of the outer-code parity data is arranged as
a final line, and

20 said reproduction section reproduces the data ID
from the head position of each physical sector data
block.

20. An apparatus according to claim 19, wherein
the physical sector area read out by said read-out
25 section records data alternately extracted from
different data lines in the physical sector data block,
and

said reproduction section reproduces the physical sector data block read out from the physical sector area under a condition that the data alternately extracted from the different data lines is recorded.

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